Listing of Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A solid state electrolytic device, comprising:

   a cathode,

   an anode, and

   disposed between the anode and the cathode is a solid electrolyte capable of fluorine ion exchange without destroying the solid electrolyte, and wherein fluorine may be generated at the anode by transferring fluorine ions from one electrode to the other through the solid electrolyte.

2. (previously presented) The solid state electrolytic device of claim 1, wherein: the device is disposed on top of a substrate.

3. (previously presented) The solid state electrolytic device of claim 2, wherein: the substrate is comprised of a material chosen from the group consisting of chromium, silver, copper, iron, nickel, low-chromium ferritic steels, intermediate-chromium ferritic steels, high-chromium ferritic steels, chrome-based alloys, a ceramic material, a cermet, a chrome-containing nickel-based Inconel alloys, and stainless steel.

4. (previously presented) The solid state electrolytic device of claim 3, wherein: the substrate is comprised of stainless steel.

5. (previously presented) The solid state electrolytic device of claim 1, wherein: the electrolyte is comprised of materials chosen from the group consisting of $PbSnF_4$, LaF_3 and doped LaF_3.

6. (previously presented) The solid state electrolytic device of claim 5, wherein:

   the electrolyte comprises $PbSnF_4$.

7. (previously presented) The solid state electrolytic device of claim 1, wherein:

   the anode and cathode each independently comprise a material chosen from the group consisting of Pt, Au, Ni, Pd, Cu, Ag and graphitic carbon.

8. (previously presented) The solid state electrolytic device of claim 7, wherein:

   the cathode comprises Pt.

9. (previously presented) The solid state electrolytic device of claim 8, wherein:

   the cathode comprises Pt particles having a diameter of between .05 and 20 microns.

10. (previously presented) The solid state electrolytic device of claim 9, wherein:

    the Pt particles have a diameter of between .7 and 2 microns.

11. (previously presented) The solid state electrolytic device of claim 7, wherein:

    the graphitic carbon contains about 40 wt% coal tar pitch.

12. (previously presented) The solid state electrolytic device of claim 1, wherein:

    the device is capable of operating at temperatures ranging from 100 to 300 °C.

13. (previously presented) The solid state electrolytic device of claim 12, wherein:

    the device is capable of operating at temperatures of from 120 to 150 °C.

14. (previously presented) The solid state electrolytic device of claim 1, wherein:

    the electrolyte is deposited by CVD, EVD, sputtering or melt solidification.

15. (previously presented) The solid state electrolytic device of claim 14, wherein:

    the electrolyte is deposited by melt solidification.

16. (previously presented) The solid state electrolytic device of claim 1, wherein:

there is disposed between the anode and the electrolyte, or the cathode and electrolyte, or both, a thin protective layer.

17. (previously presented) The solid state electrolytic device of claim 16, wherein: the protective layer comprises a doped or undoped alkali or alkaline earth metal fluoride or doped or undoped LaF_3.

18. (previously presented) The solid state electrolytic device of claim 17, wherein: the protective layer comprises doped or undoped LaF_3.

19. (previously presented) The solid state electrolytic device of claim 1, wherein: the device is capable of separating fluorine from a mixture of gases.

20. (previously presented) The solid state electrolytic device of claim 1, wherein: the device is capable of generating fluorine from an input source.

21. (previously presented) The solid state electrolytic device of claim 20, wherein: the input source comprises a solid, a liquid or a gas.

22. (cancelled)

23. (previously presented) The solid state electrolytic device of claim 1, wherein: the device is tubular shaped.

24. (new) The solid state electrolytic device of claim 1, wherein the solid electrolyte comprises LaF_3.

25. (new) A method of generating fluorine, comprising:

inputting a gas into a solid state electrolytic device, said device comprising a cathode, an anode and disposed between the anode and the cathode is a solid electrolyte capable of fluorine ion exchange without destroying the solid electrolyte, and wherein fluorine is generated at the anode by transferring fluorine ions from one electrode to the other through the solid electrolyte.

26. (new) The method as claimed in claim 25, wherein:

the solid state electrolyte comprises LaF_3 or doped LaF_3.

27. (new) The method as claimed in claim 25, wherein:

the input gas comprises HF, NF_3, CF_4 or SF_6, or mixtures thereof.

28. (new) A method of separating fluorine gas from a gas mixture, comprising:

inputting a gas mixture into a solid state electrolytic device, said device comprising a cathode, an anode and disposed between the anode and the cathode is a solid electrolyte capable of fluorine ion exchange without destroying the solid electrolyte, and

wherein fluorine is generated at the anode by transferring fluorine ions from one electrode to the other through the solid electrolyte.

29. (new) A method as claimed in claim 28, wherein:

the solid state electrolyte comprises LaF_3 or doped LaF_3.